

CLAIMS

1. A boron aluminosilicate glass comprising at least the following components (in wt.-%):

| | |
|-------------------------|------------|
| SiO_2 | 40 to 47 |
| B_2O_3 | 0.1 to 6 |
| Al_2O_3 | 0.1 to 4 |
| P_2O_5 | 0. to 4 |
| Li_2O | 0 to 2 |
| Na_2O | 2 to 7 |
| K_2O | >6.5 to 11 |
| MgO | 0 to 5 |
| CaO | 0. to 6 |
| BaO | 6 to 14 |
| ZnO | 20 to 25 |
| La_2O_3 | 0 to 1.5 |
| ZrO_2 | 1 to 7. |

2. The boron aluminosilicate glass of claim 1 comprising in wt.-%):

| | |
|-------------------------|------------|
| SiO_2 | 42 to 47 |
| B_2O_3 | 0.1 to 5 |
| Al_2O_3 | 0.1 to 2 |
| P_2O_5 | 0.5 to 3 |
| Na_2O | 3 to 6 |
| K_2O | >6.5 to 10 |
| CaO | 1 to 5 |
| BaO | 6 to 12 |
| ZnO | 20 to 25 |
| ZrO_2 | 3 to 7, |

up to 1 wt.-% of refining agents.

3. A boron aluminosilicate glass comprising at least the following components (in wt.-%):

| | |
|-------------------------|------------|
| SiO_2 | 38 to 45 |
| B_2O_3 | 0.1 to 6 |
| Al_2O_3 | 0.1 to 4 |
| P_2O_5 | 0.1 to 4 |
| Li_2O | >2 to 6 |
| Na_2O | 2 to 7 |
| K_2O | 2 to 6.5 |
| MgO | 0 to 5 |
| CaO | 0.5 to 6.5 |
| BaO | 6 to 14.5 |
| ZnO | 14 to <20 |
| La_2O_3 | >1.5 to 5 |
| ZrO_2 | 1 to 7. |

4. The boron aluminosilicate glass of claim 3, comprising the following components (in wt.-%):

| | |
|-------------------------|-----------|
| SiO_2 | 38 to 43 |
| B_2O_3 | 0.1 to 5 |
| Al_2O_3 | 0.5 to 3 |
| P_2O_5 | 0.5 to 3 |
| Li_2O | >2 to 6 |
| Na_2O | 3 to 6 |
| K_2O | 3 to 6.5 |
| CaO | 2 to 6.5 |
| BaO | 8 to 14.5 |
| ZnO | 14 to 19 |
| La_2O_3 | >1.5 to 3 |
| ZrO_2 | 2 to 5, |

up to 1 wt.-% of refining agents.

5. A boron aluminosilicate glass comprising (in wt.-%):

| | |
|--------------------------------|-----------|
| SiO ₂ | 35 to 50 |
| B ₂ O ₃ | 0.1 to 7 |
| Al ₂ O ₃ | 0.1 to 7 |
| P ₂ O ₅ | 0.1 to 4 |
| R ₂ O | 4 to 24 |
| RO | 0 to 12 |
| BaO | 6 to 14.5 |
| ZnO | 14 to 25 |
| La ₂ O ₃ | 0 to 5 |
| ZrO ₂ | 0 to 10, |

wherein R₂O is an alkali oxide, RO is an alkaline earth oxide apart from BaO, wherein the amount of Li₂O is 6 wt.-% maximum and wherein the glass, apart from any unintended contaminants, does not contain any GeO₂, SnO, SnO₂, Sb₂O₃, AgO or any rare earth metals.

6. The boron aluminosilicate glass of claim 5 which comprises up to 1 wt.-% of refining agents.

7. The boron aluminosilicate glass of claim 6, wherein said refining agents comprise at least one component selected from the group formed by Sb₂O₃, As₂O₃, SnO, NaCl, SO₄²⁻ and F.

8. The boron aluminosilicate glass of claim 5 comprising (in wt.-%):

| | |
|-------------------------|------------|
| SiO_2 | 35 to 50 |
| B_2O_3 | 0.1 to 7 |
| Al_2O_3 | 0.1 to 7 |
| P_2O_5 | 0.1 to 4 |
| Li_2O | 0 to 6 |
| Na_2O | 2 to 7 |
| K_2O | 2 to 11 |
| MgO | 0 to 5 |
| CaO | 0.5 to 6.5 |
| BaO | 6 to 14.5 |
| ZnO | 14 to 25 |
| La_2O_3 | 0 to 5 |
| ZrO_2 | 1 to 10 |

refining agents in common amounts.

9. The boron aluminosilicate glass of claim 7, wherein the portion of RO in the total weight is smaller than the portion of BaO.

10. The boron aluminosilicate glass of claim 5, comprising at least the following components (in wt.-%):

| | |
|--------------------------------|------------|
| SiO ₂ | 38 to 47 |
| B ₂ O ₃ | 0.1 to 6 |
| Al ₂ O ₃ | 0.1 to 4 |
| P ₂ O ₅ | 0.1 to 4 |
| Li ₂ O | 0 to 6 |
| Na ₂ O | 2 to 7 |
| K ₂ O | 2 to 11 |
| MgO | 0 to 5 |
| CaO | 0.5 to 6.5 |
| BaO | 6 to 14.5 |
| ZnO | 14 to 25 |
| La ₂ O ₃ | 0 to 5 |
| ZrO ₂ | 1 to 7. |

11. The boron aluminosilicate glass of claim 5 having a refractive index n_d of 1.54 = $n_d = 1.62$.

12. The boron aluminosilicate glass of claim 5 having an Abbe number of 48 = $v_d = 57$.

13. An optical stepped-index fiber comprising a core glass according to claim 5, and further comprising a cladding glass fully enclosing an outer surface of said core glass and having a numerical aperture of 0.28 to 0.70.

14. The optical stepped-index fiber of claim 13, wherein said cladding glass comprises (in wt.-%):

SiO_2 60 to 72

B_2O_3 < 20

Na_2O < 18

K_2O < 15

Li_2O < 2

MgO < 3

BaO < 3

SrO < 4

CaO < 6

ZnO < 3

F^- < 1

other oxides 0 to 3,

up to 1 wt.-% of refining agents.

15. The optical stepped-index fiber of claim 13, wherein said cladding glass comprises (in wt.-%):

| | |
|------------------------|----------|
| SiO_2 | 60 to 72 |
| B_2O_3 | < 20 |
| Na_2O | < 18 |
| K_2O | < 15 |
| Li_2O | < 2 |
| MgO | < 3 |
| BaO | < 3 |
| SrO | < 4 |
| CaO | < 6 |
| ZnO | < 3 |
| F^- | < 1. |

16. The optical stepped-index fiber of claim 13, wherein said cladding glass, apart from any unintended contaminants, does not contain any Cs_2O .

17. The optical stepped-index fiber of claim 13, wherein in said cladding glass the sum of the components Na_2O , Li_2O and K_2O is smaller than 3 wt.-%.

18. The optical stepped-index fiber of claim 17 wherein in said cladding glass the content of SiO_2 is between 66 and 72 wt.-%.